

SEQUENCE LISTING

B1

<110> ARISTIDOU, Aristos
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TELEMAN, Anita
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<120> TRANSFORMED MICROORGANISMS WITH IMPROVED PROPERTIES

<130> 0933-148P

<140> 09/423,554

<141> 1999-11-10

<150> PCT/FI99/00185

<151> 1999-03-11

<160> 14

<170> PatentIn Ver. 2.0

<210> 1

<211> 71

<212> PRT

<213> Aspergillus nidulans

<400> 1

Arg	Gly	Thr	Asn	Asn	Glu	Glu	Leu	Leu	Asn	Asp	Lys	Leu	Tyr	Leu	Gly
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Leu	Arg	Gln	Arg	Arg	Ala	Gln	Gly	Glu	Glu	Tyr	Asp	Lys	Phe	Val	Asp
			20					25					30		

Lys	Phe	Val	Arg	Met	Ala	Gly	Arg	Gly	Phe	Pro	Met	Pro	Ile	Ser	Thr
		35					40					45			

Cys	Ser	Glu	Asp	Phe	Gly	Leu	Gln	Asn	Ala	Lys	Arg	Ile	Leu	Asp	Arg
	50						55				60				

Tyr	Arg	Ser	Gln	Leu	Pro	Cys
65					70	

<210> 2

B¹

<211> 156
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 <213> Trichoderma reesei

<400> 2

Ala Gly Ala His Arg Gly Gly Gly Arg Ser Arg Thr Ser Gly Ser Pro
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Gly Cys Arg Asn Ser Ala Arg Gly Met Asn Ser Ile Leu Arg Thr Thr
 20 25 30

Ser Ser Arg Leu Ser Lys Ser Ser Asn Ile His Cys Thr Ser Thr Leu
 35 40 45

Arg Tyr Ser Pro Gln Arg Ser Ser Ser Pro Leu Cys Cys Lys Pro Arg
 50 55 60

Ser Ser Ser Ser Leu Thr Met Ser Ser Ser Lys Pro Thr Lys Phe Ser
 65 70 75 80

His Leu Pro Leu Ser Thr Thr Gly Pro Leu Glu Cys Ala Leu Thr Gly
 85 90 95

Thr Ala Leu Leu Asn Ser Pro Ile Phe Asn Lys Gly Ser Ala Phe Pro
 100 105 110

Leu Ser Glu Arg Arg Gln Phe Asn Leu Thr Gly Leu Leu Pro Ala Asn
 115 120 125

Glu Gln Thr Leu Asp Asn Gln Val Lys Arg Ala Tyr Gln Gln Tyr Gln
 130 135 140

Ser Arg Gly Asp Asp Trp Pro Arg Thr Val Pro Asp
 145 150 155

<210> 3
 <211> 584
 <212> PRT
 <213> Homo sapiens

<400> 3

Met Leu Ser Arg Leu Arg Val Val Ser Thr Thr Cys Thr Leu Ala Cys
 1 5 10 15

Arg His Leu His Ile Lys Glu Lys Gly Lys Pro Leu Met Leu Asn Pro
 20 25 30

Arg Thr Asn Lys Gly Met Ala Phe Thr Leu Gln Glu Arg Gln Met Leu
 35 40 45
 Gly Leu Gln Gly Leu Leu Pro Pro Lys Ile Glu Thr Gln Asp Ile Gln
 50 55 60
 Ala Leu Arg Phe His Arg Asn Leu Lys Lys Met Thr Ser Pro Leu Glu
 65 70 75 80
 Lys Tyr Ile Tyr Ile Met Gly Ile Gln Glu Arg Asn Glu Lys Leu Phe
 85 90 95
 Tyr Arg Ile Leu Gln Asp Asp Ile Glu Ser Leu Met Pro Ile Val Tyr
 100 105 110
 Thr Pro Thr Val Gly Leu Ala Cys Ser Gln Tyr Gly His Ile Phe Arg
 115 120 125
 Arg Pro Lys Gly Leu Phe Ile Ser Ile Ser Asp Arg Gly His Val Arg
 130 135 140
 Ser Ile Val Asp Asn Trp Pro Glu Asn His Val Lys Ala Val Val Val
 145 150 155 160
 Thr Asp Gly Glu Arg Ile Leu Gly Leu Gly Asp Leu Gly Val Tyr Gly
 165 170 175
 Met Gly Ile Pro Val Gly Lys Leu Cys Leu Tyr Thr Ala Cys Ala Gly
 180 185 190
 Ile Arg Pro Asp Arg Cys Leu Pro Val Cys Ile Asp Val Gly Thr Asp
 195 200 205
 Asn Ile Ala Leu Leu Lys Asp Pro Phe Tyr Met Gly Leu Tyr Gln Lys
 210 215 220
 Arg Asp Arg Thr Gln Gln Tyr Asp Asp Leu Ile Asp Glu Phe Met Lys
 225 230 235 240
 Ala Ile Thr Asp Arg Tyr Gly Arg Asn Thr Leu Ile Gln Phe Glu Asp
 245 250 255
 Phe Gly Asn His Asn Ala Phe Arg Phe Leu Arg Lys Tyr Arg Glu Lys
 260 265 270
 Tyr Cys Thr Phe Asn Asp Asp Ile Gln Gly Thr Ala Ala Val Ala Leu
 275 280 285

B'

Ala Gly Leu Leu Ala Ala Gln Lys Val Ile Ser Lys Pro Ile Ser Glu			
290	295	300	
His Lys Ile Leu Phe Leu Gly Ala Gly Glu Ala Ala Leu Gly Ile Ala			
305	310	315	320
Asn Leu Ile Val Met Ser Met Val Glu Asn Gly Leu Ser Glu Gln Glu			
	325	330	335
Ala Gln Lys Lys Ile Trp Met Phe Asp Lys Tyr Gly Leu Leu Val Lys			
	340	345	350
Gly Arg Lys Ala Lys Ile Asp Ser Tyr Gln Glu Pro Phe Thr His Ser			
	355	360	365
Ala Pro Glu Ser Ile Pro Asp Thr Phe Glu Asp Ala Val Asn Ile Leu			
	370	375	380
Lys Pro Ser Thr Ile Ile Gly Val Ala Gly Ala Gly Arg Leu Phe Thr			
385	390	395	400
Pro Asp Val Ile Arg Ala Met Ala Ser Ile Asn Glu Arg Pro Val Ile			
	405	410	415
Phe Ala Leu Ser Asn Pro Thr Ala Gln Ala Glu Cys Thr Ala Glu Glu			
	420	425	430
Ala Tyr Thr Leu Thr Glu Gly Arg Cys Leu Phe Ala Ser Gly Ser Pro			
	435	440	445
Phe Gly Pro Val Lys Leu Thr Asp Gly Arg Val Phe Thr Pro Gly Gln			
	450	455	460
Gly Asn Asn Val Tyr Ile Phe Pro Gly Val Ala Leu Ala Val Ile Leu			
465	470	475	480
Cys Asn Thr Arg His Ile Ser Asp Ser Val Phe Leu Glu Ala Ala Lys			
	485	490	495
Ala Leu Thr Ser Gln Leu Thr Asp Glu Glu Leu Ala Gln Gly Arg Leu			
	500	505	510
Tyr Pro Pro Leu Ala Asn Ile Gln Glu Val Ser Ile Asn Ile Ala Ile			
	515	520	525
Lys Val Thr Glu Tyr Leu Tyr Ala Asn Lys Met Ala Phe Arg Tyr Pro			
	530	535	540

B'

Glu Pro Glu Asp Lys Ala Lys Tyr Val Lys Glu Arg Thr Trp Arg Ser
545 550 555 560

Glu Tyr Asp Ser Leu Leu Pro Asp Val Tyr Glu Trp Pro Glu Ser Ala
565 570 575

Ser Ser Pro Pro Val Ile Thr Glu
580

<210> 4

<211> 565

<212> PRT

<213> Schizosaccharomyces pombe

<400> 4

Met Pro Ala Gly Thr Lys Glu Gln Ile Glu Cys Pro Leu Lys Gly Val
1 5 10 15

Thr Leu Leu Asn Ser Pro Arg Tyr Asn Lys Asp Thr Ala Phe Thr Pro
20 25 30

Glu Glu Arg Gln Lys Phe Glu Ile Ser Ser Arg Leu Pro Pro Ile Val
35 40 45

Glu Thr Leu Gln Gln Gln Val Asp Arg Cys Tyr Asp Gln Tyr Lys Ala
50 55 60

Ile Gly Asp Glu Pro Leu Gln Lys Asn Leu Tyr Leu Ser Gln Leu Ser
65 70 75 80

Val Thr Asn Gln Thr Leu Phe Tyr Ala Leu Ile Ser Gln His Leu Ile
85 90 95

Glu Met Ile Pro Ile Ile Tyr Thr Pro Thr Glu Gly Asp Ala Ile Lys
100 105 110

Gln Phe Ser Asp Ile Tyr Arg Tyr Pro Glu Gly Cys Tyr Leu Asp Ile
115 120 125

Asp His Asn Asp Leu Ser Tyr Ile Lys Gln Gln Leu Ser Glu Phe Gly
130 135 140

Lys Ser Asp Ser Val Glu Tyr Ile Ile Ile Thr Asp Ser Glu Gly Ile
145 150 155 160

Leu Gly Ile Gly Asp Gln Gly Val Gly Gly Val Leu Ile Ser Val Ala
165 170 175

81

Lys	Gly	His	Leu	Met	Thr	Leu	Cys	Ala	Gly	Leu	Asp	Pro	Asn	Arg	Phe	180	185	190	
Leu	Pro	Ile	Val	Leu	Asp	Val	Gly	Thr	Asn	Asn	Glu	Thr	His	Arg	Lys	195	200	205	
Asn	His	Gln	Tyr	Met	Gly	Leu	Arg	Lys	Asp	Arg	Val	Arg	Gly	Glu	Gln	210	215	220	
Tyr	Asp	Ser	Phe	Leu	Asp	Asn	Val	Ile	Lys	Ala	Ile	Arg	Glu	Val	Phe	225	230	235	240
Pro	Glu	Ala	Phe	Ile	His	Phe	Glu	Asp	Phe	Gly	Leu	Ala	Asn	Ala	Lys	245	250	255	
Arg	Ile	Leu	Asp	His	Tyr	Arg	Pro	Asp	Ile	Ala	Cys	Phe	Asn	Asp	Asp	260	265	270	
Ile	Gln	Gly	Thr	Gly	Ala	Val	Ala	Leu	Ala	Ala	Ile	Ile	Gly	Ala	Leu	275	280	285	
His	Val	Thr	Lys	Ser	Pro	Leu	Thr	Glu	Gln	Arg	Ile	Met	Ile	Phe	Gly	290	295	300	
Ala	Gly	Thr	Ala	Gly	Val	Gly	Ile	Ala	Asn	Gln	Ile	Val	Ala	Gly	Met	305	310	315	320
Val	Thr	Asp	Gly	Leu	Ser	Leu	Asp	Lys	Ala	Arg	Gly	Asn	Leu	Phe	Met	325	330	335	
Ile	Asp	Arg	Cys	Gly	Leu	Leu	Leu	Glu	Arg	His	Ala	Lys	Ile	Ala	Thr	340	345	350	
Asp	Gly	Gln	Lys	Pro	Phe	Leu	Lys	Lys	Asp	Ser	Asp	Phe	Lys	Glu	Val	355	360	365	
Pro	Ser	Gly	Asp	Ile	Asn	Leu	Glu	Ser	Ala	Ile	Ala	Leu	Val	Lys	Pro	370	375	380	
Thr	Ile	Leu	Leu	Gly	Cys	Ser	Gly	Gln	Pro	Gly	Lys	Phe	Thr	Glu	Lys	385	390	395	400
Ala	Ile	Arg	Glu	Met	Ser	Lys	His	Val	Glu	Arg	Pro	Ile	Ile	Phe	Pro	405	410	415	
Ile	Ser	Asn	Pro	Thr	Thr	Leu	Met	Glu	Ala	Lys	Pro	Asp	Gln	Ile	Asp	420	425	430	

B1

Lys Trp Ser Asp Gly Lys Ala Leu Ile Ala Thr Gly Ser Pro Leu Pro
435 440 445

Pro Leu Asn Arg Asn Gly Lys Lys Tyr Val Ile Ser Gln Cys Asn Asn
450 455 460

Ala Leu Leu Tyr Pro Ala Leu Gly Val Ala Cys Val Leu Ser Arg Cys
465 470 475 480

Lys Leu Leu Ser Asp Gly Met Leu Lys Ala Ala Ser Asp Ala Leu Ala
485 490 495

Thr Val Pro Arg Ser Leu Phe Ala Ala Asp Glu Ala Leu Leu Pro Asp
500 505 510

Leu Asn Asn Ala Arg Glu Ile Ser Arg His Ile Val Phe Ala Val Leu
515 520 525

Lys Gln Ala Val Ser Glu Gly Met Ser Thr Val Asp Leu Pro Lys Asp
530 535 540

Asp Ala Lys Leu Lys Glu Trp Ile Ile Glu Arg Glu Trp Asn Pro Glu
545 550 555 560

Tyr Lys Pro Phe Val
565

<210> 5

<211> 669

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 5

Met Leu Arg Thr Arg Leu Ser Val Ser Val Ala Ala Arg Ser Gln Leu
1 5 10 15

Thr Arg Ser Leu Thr Ala Ser Arg Thr Ala Pro Leu Arg Arg Trp Pro
20 25 30

Ile Gln Gln Ser Arg Leu Tyr Ser Ser Asn Thr Arg Ser His Lys Ala
35 40 45

Thr Thr Thr Arg Glu Asn Thr Phe Gln Lys Pro Tyr Ser Asp Glu Glu
50 55 60

Val Thr Lys Thr Pro Val Gly Ser Arg Ala Arg Lys Ile Phe Glu Ala

21

65		70		75		80
Pro His	Pro His	Ala Thr	Arg Leu	Thr Val	Glu Gly	Ala Ile
		85		90		95
Pro Leu	Glu Ser	Phe Gln	Leu Leu	Asn Ser	Pro Leu	Phe Asn
	100		105		110	
Ser Ala	Phe Thr	Gln Glu	Glu Arg	Glu Ala	Phe Asn	Leu Glu
	115		120		125	
Leu Pro	Pro Gln	Val Asn	Thr Leu	Asp Glu	Gln Leu	Glu Arg
	130		135		140	
Lys Gln	Leu Cys	Tyr Leu	Lys Thr	Pro Leu	Ala Lys	Asn Asp
	145		150		155	
Thr Ser	Leu Arg	Val Gln	Asn Lys	Val Leu	Tyr Phe	Ala Leu
		165		170		175
Arg His	Ile Lys	Glu Leu	Val Pro	Ile Ile	Tyr Thr	Pro Thr
	180		185		190	
Asp Ala	Ile Ala	Ala Tyr	Ser His	Arg Phe	Arg Lys	Pro Glu
	195		200		205	
Phe Leu	Asp Ile	Thr Glu	Pro Asp	Ser Ile	Glu Cys	Arg Leu
	210		215		220	
Tyr Gly	Gly Asp	Lys Asp	Val Asp	Tyr Ile	Val Val	Ser Asp
	225		230		235	
Gly Ile	Leu Gly	Ile Gly	Asp Gln	Gly Ile	Gly Gly	Val Arg
	245		250		255	
Ile Ser	Lys Leu	Ala Leu	Met Thr	Leu Cys	Gly Gly	Ile His
	260		265		270	
Arg Val	Leu Pro	Val Cys	Leu Asp	Val Gly	Thr Asn	Asn Lys
	275		280		285	
Ala Arg	Asp Glu	Leu Tyr	Met Gly	Asn Lys	Phe Ser	Arg Ile
	290		295		300	
Lys Gln	Tyr Asp	Asp Phe	Leu Glu	Lys Phe	Ile Lys	Ala Val
	305		310		315	
Val Tyr	Pro Ser	Ala Val	Leu His	Phe Glu	Asp Phe	Gly Val
						Lys Asn

21

					325						330					335
Ala	Arg	Arg	Leu	Leu	Glu	Lys	Tyr	Arg	Tyr	Glu	Leu	Pro	Ser	Phe	Asn	
			340					345					350			
Asp	Asp	Ile	Gln	Gly	Thr	Gly	Ala	Val	Val	Met	Ala	Ser	Leu	Ile	Ala	
		355					360					365				
Ala	Leu	Lys	His	Thr	Asn	Arg	Asp	Leu	Lys	Asp	Thr	Arg	Val	Leu	Ile	
	370					375					380					
Tyr	Gly	Ala	Gly	Ser	Ala	Gly	Leu	Gly	Ile	Ala	Asp	Gln	Ile	Val	Asn	
385					390					395					400	
His	Met	Val	Thr	His	Gly	Val	Asp	Lys	Glu	Glu	Ala	Arg	Lys	Lys	Ile	
				405				410					415			
Phe	Leu	Met	Asp	Arg	Arg	Gly	Leu	Ile	Leu	Gln	Ser	Tyr	Glu	Ala	Asn	
		420					425					430				
Ser	Thr	Pro	Ala	Gln	His	Val	Tyr	Ala	Lys	Ser	Asp	Ala	Glu	Trp	Ala	
	435						440				445					
Gly	Ile	Asn	Thr	Arg	Ser	Leu	His	Asp	Val	Val	Glu	Asn	Val	Lys	Pro	
	450					455				460						
Thr	Cys	Leu	Val	Gly	Cys	Ser	Thr	Gln	Ala	Gly	Ala	Phe	Thr	Gln	Asp	
465					470					475					480	
Val	Val	Glu	Glu	Met	His	Lys	His	Asn	Pro	Arg	Pro	Ile	Ile	Phe	Pro	
				485				490						495		
Leu	Ser	Asn	Pro	Thr	Arg	Leu	His	Glu	Ala	Val	Pro	Ala	Asp	Leu	Met	
		500						505					510			
Lys	Trp	Thr	Asn	Asn	Asn	Ala	Leu	Val	Ala	Thr	Gly	Ser	Pro	Phe	Pro	
	515					520					525					
Pro	Val	Asp	Gly	Tyr	Arg	Ile	Ser	Glu	Asn	Asn	Asn	Cys	Tyr	Ser	Phe	
	530					535					540					
Pro	Gly	Ile	Gly	Leu	Gly	Ala	Val	Leu	Ser	Arg	Ala	Thr	Thr	Ile	Thr	
545				550				555						560		
Asp	Lys	Met	Ile	Ser	Ala	Ala	Val	Asp	Gln	Leu	Ala	Glu	Leu	Ser	Pro	
			565					570				575				
Leu	Arg	Glu	Gly	Asp	Ser	Arg	Pro	Gly	Leu	Leu	Pro	Gly	Leu	Asp	Thr	

21

	580		585		590
Ile Thr Asn Thr Ser Ala Arg Leu Ala Thr Ala Val Ile Leu Gln Ala					
	595		600		605
Leu Glu Glu Gly Thr Ala Arg Ile Glu Gln Glu Gln Val Pro Gly Gly					
	610		615		620
Ala Pro Gly Glu Thr Val Lys Val Pro Arg Asp Phe Asp Glu Cys Leu					
	625		630		635
					640
Gln Trp Val Lys Ala Gln Met Trp Glu Pro Val Tyr Arg Pro Met Ile					
		645		650	655
Lys Val Gln His Asp Pro Ser Val His Thr Asn Gln Leu					
	660		665		

<210> 6
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Primer

<400> 6
 ccagtgatat cgaggatgag attagtac 28

<210> 7
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Primer

<400> 7
 ccagtgatat ctgtacttgt cagggcac 28

<210> 8
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Primer

81
<400> 8
catgctaagc ttctagaatg cttagaacca gacta 35

<210> 9
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Primer

<400> 9
gatgctaagc ttctagatgg ttatgcttcg tctac 35

<210> 10
<211> 17
<212> PRT
<213> Aspergillus nidulans

<400> 10
Phe Asn Asp Asp Ile Gln Gly Thr Gly Ala Val Val Met Ala Ser Leu
1 5 10 15

Ile

<210> 11
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Primer

<220>
<221> modified_base
<222> (1)..(17)
<223> Any N = Inosine

<400> 11
gaygtnggna cnaayaa 17

<210> 12
<211> 23
<212> DNA
<213> Artificial Sequence

21
<220>
<223> Description of Artificial Sequence:Primer

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<221> modified_base
<222> (1)..(23)
<223> N = Inosine

<400> 12
gtnccttgda trtctctcrtt raa 23

<210> 13
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Primer

<400> 13
gaggatccat aggagcgcat gttggacc 28

<210> 14
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Primer

<400> 14
caggatcctc tgtagggat ttactcc 27

Receipt

Serial Number: 09/423,554
First Named Inventor: Aristos ARISTIDOU
Title of Invention: Transformed Microorganisms with Improved Properties
File Listing:
i:\JRR\0933-0148P\0933-0148Pbio.xml 2040 Bytes
I:\JRR\0933-0148P\0933-148.app 20192 Bytes
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